

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/28/2008 has been entered.

Response to Arguments

It is noted that no response was given regarding the notification of a defective oath or declaration in the previous Final Office Action. The notification is repeated herein.

Applicant's arguments filed 2/28/2008 have been fully considered but they are not persuasive.

Applicant argues that Claim 1 is distinguished from Frolich et al by the presence of the particular claimed emulsifier, which provides a dispersion of high stability. Applicant also argues that Wendel et al do not disclose or suggest a combination of the claimed cellulose reactive sizing agent and a cellulose non-reactive sizing agent. Applicant further argues that one skilled in the art would not have any reason to use the claimed emulsifiers in combination with the claimed sizing agents based on the combination of Frolich et al and Wendel et al and suggests that improper hindsight was used in combining the references. Applicant argues that both references disclose any

number of emulsifiers, that Frolich et al does not disclose the claimed emulsifier and that Wendel et al prefers a cationic emulsifier. Applicant argues that one would have to pick and choose individual aspects from the various teachings and broad range of emulsifiers disclosed by the references, or from the thousands of emulsifiers known per se, absent any teaching or suggestion to select the claimed emulsifier. Applicant further argues that the claimed emulsifier provides an unexpected improvement in stability and refers to Example 3 of the instant Specification for showing the improved stability over using just a ditallow dimethyl ammonium chloride.

"It should be too well settled now to require citation or discussion that the test for combining references is not what the individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." In re McLaughlin, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

Frolich et al discloses that preferred dispersing agents are anionic and comprise sulfate groups and carboxylic, sulfonic, phosphoric and phosphonic acid groups present as free acid or water soluble salts (e.g.-phosphates) (col 3, lines 45-55). These five kinds of anionic groups are well known to those of ordinary skill in the art.

Wendel et al discloses that conventional cationic, amphoteric or anionic surfactants can be present in conventional amounts in the polymeric sizing emulsion. Of the anionic surfactants, only three conventional (well known in the art) kinds are mentioned, alkyl sulfates, alkyl-sulfonates and alkyl phosphates, which may also be in the form of adducts with ethylene oxide (col 5, lines 2-15). Although Wendel et al states that cationic surfactants are preferred, there is no explanation or reason to guide one of ordinary skill in the art away from the several species of nonionic, anionic and amphoteric emulsifiers that are also recited. The disclosed kinds of anionic surfactants represent a large number of species, which overlap the large number of species broadly claimed in the instant application.

Frolich et al prefer anionic surfactants comprising sulfates and phosphates and Wendel et al teach that the claimed surfactants are conventionally known. Absent convincing evidence of unexpected results, one of ordinary skill in the art would have readily used any of the claimed conventional emulsifiers as a functionally equivalent option suitable for both the non-cellulose reactive polymeric sizing agent of Wendel et al and the AKD sizing agent of Frolich et al, and the results would have been predictable.

Regarding the unexpected improvement in stability, the referenced example compares the results of using a commercially available (conventionally known) polyoxyethylene phosphate ester of unspecified composition and a specific mixture of commercially available sizing agents, also of unspecified composition, with a single example wherein the polyoxyethylene phosphate ester is not used. The results are not commensurate with the scope of the broadly claimed subject matter.

The outstanding rejections have been modified to include a third reference, Holmberg et al, as further support for the obviousness of the claimed surfactants. In addition, a new ground of rejection is made as detailed below.

Oath/Declaration

The oath or declaration submitted 6/21/2004 is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02. The oath or declaration is defective because:

It does not state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.

The originally submitted Oath recites the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56(a), rather than 37 CFR 1.56.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 17 and 19-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Holmberg et al (6692560).

Holmberg et al discloses sizing compositions, a process of forming the compositions and a process of treating paper by stock sizing or surface sizing with the

compositions. The compositions comprise a non-cellulose reactive sizing agent and/or a cellulose reactive sizing agent, such as a ketene dimer or multimer, a non-ionic surfactant, an anionic surfactant and a monohydric alcohol (Abs; col 1, line 66 to col 2, line 24). The anionic surfactant is a sulphur containing surfactant, such as polyoxyalkylene alkyl sulphonates and polyoxyalkylene alkylaryl ether sulphonates, each containing 2-50 moles of alkylene oxide units (col 4, lines 3-7 and 32-51). Aqueous dispersions are produced by homogenizing the sizing agent in the presence of the other ingredients (col 2, lines 5-8). Note that the open language of the instant Claims permits additional additives, such as the disclosed nonionic surfactant and monohydric alcohol.

The claimed steps of forming a paper web and applying the sizing dispersion to the surface of the paper web are inherent steps in surface sizing paper in a papermaking process. Similarly, the steps of adding the dispersion to a stock containing cellulosic fibers are inherent in stock sizing of paper.

The aqueous sizing dispersion disclosed by Holmberg et al is substantially the same as the claimed dispersion thus will have the claimed stability properties because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frolich et al (6306255) in view of Wendel et al (4051093) and Holmberg et al.

Claims 1, 4-6 and 21-22: Frolich et al discloses an aqueous dispersion for paper sizing comprising a cellulose-reactive sizing agent, most preferably a ketene dimer, a non-cellulose reactive sizing agent, and a hydrophobically modified dispersing agent that is preferably anionic and contains sulfate, sulfonic, phosphate or phosphonic acid groups (Abs; col 2, lines 49-56; col 3, lines 22-24 and 45-55). The sizing dispersion can be used for surface or internal sizing (col 9, lines 1-4).

Frolich et al does not disclose the claimed emulsifier.

Wendel et al discloses a paper sizing composition comprising a copolymer emulsion and an anionic, nonionic or cationic emulsifier. Wendel et al teaches that conventional anionic emulsifiers include alkyl sulfates, alkyl sulfonates and alkyl phosphates that can be in the form of adducts of ethylene oxide (Abs; col 1, lines 33-34; col 5, lines 12-15).

The disclosure of Holmberg et al is used as above.

The art of Frolich et al, Wendel et al, Holmberg et al and the instant invention is analogous as pertaining to sizing dispersions for paper. Polyoxyalkylene alkyl

sulphonates and polyoxyalkylene alkylaryl ether sulphonates, which contain 2-50 moles of alkylene oxide units, are taught by Holmberg et al as desirable anionic surfactants for use with dispersions of AKD and a cellulose non-reactive sizing agent. Similar surfactants, including those containing phosphates, are taught by Wendel et al for use with the claimed cellulose non-reactive sizing agents. Frolich et al prefers sulfate and phosphate containing emulsifiers with dispersions of AKD and a cellulose non-reactive sizing agent. All of the claimed elements were conventionally known in the prior art. It would have been obvious to one of ordinary skill in the art to use the claimed emulsifier in the dispersion of Frolich et al in view of Wendel et al and Holmberg et al as a conventionally known emulsifier and functionally equivalent option, and the results would have been predictable.

The aqueous sizing dispersion so made is substantially the same as the claimed dispersion and have the claimed stability properties because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claims 2 and 9: Frolich discloses the presence of a surfactant of the general formula $R_4N^+X^-$, each R is independently H or a hydrocarbon group having from 1 to 30 carbon atoms, and X^- is an anion (col 4, lines 35-50 and 60). The disclosed list of

Art Unit: 1791

examples of surfactants is almost identical to the list of examples recited in the instant Disclosure on p 5, lines 8-15, and thus meets the claimed molecular weight.

Claims 3 and 10: The anionic emulsifier is an anionic stabilizer. Alternatively, Frolich et al teaches that alkyl ketene dimers are usually prepared using a sodium lignosulfate (a lignin sulfonate) (col 1, lines 21-24), thus it would have been obvious to one of ordinary skill in the art to include a typical dispersant used with alkyl ketene dimers.

Claims 7-8: Frolich does not disclose a non-reactive size comprising styrene or alkyl esters of (meth)acrylic acid.

Wendel et al discloses that the non-reactive copolymer sizing agent comprises:

(A) from 0.5 to 15 per cent by weight of monomers containing a polymerizable

C=C bond and at least one carboxyl and/or sulfonic acid or phosphate or phosphite group,

(B) from 5 to 30 per cent by weight of monomers containing a C=C bond and a tertiary or quaternary amino group, or a nitrogen-containing heterocyclic group,

(C) from 0 to 94.5 per cent by weight of styrene and/or acrylonitrile

(D) from 0 to 94.5 per cent by weight of acrylic or methacrylic acid esters of alkanols of 1 to 8 carbon atoms, and

(E) from 0 to 30 per cent by weight of further olefinically unsaturated monomers.

The amount of monomers C and D is at least 25%, preferably at least 70%, and up to 94.5% by weight of the polymer. Wendel et al discloses that preferred

Art Unit: 1791

(meth)acrylic acid esters are methyl (meth)acrylates, ethyl (meth)acrylates, n-propyl (meth)acrylates, n-butyl (meth)acrylates and isobutyl (meth)acrylates (Abs; col 2, lines 8-49, particularly lines 44-49; col 4, lines 63-65). Thus, in some embodiments, the polymer of Wendel et al comprises 94.5% styrene and alkyl (meth)acrylates, the remainder being other ethylenically unsaturated monomers. Wendel et al recites suitable emulsifiers for use in the sizing emulsion are anionic alkyl sulfates, alkyl sulfonates and alkyl phosphates that can be in the form of adducts of ethylene oxide (col 5, lines 12-15). Note that the instant claim language allows for additional species of ethylenically unsaturated monomers.

The following is from MPEP 2144.06:

"It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted) (Claims to a process of preparing a spray-dried detergent by mixing together two conventional spray-dried detergents were held to be prima facie obvious.).

Frolich et al and Wendel et al disclose sizing dispersions for papers. It would have been obvious to one of ordinary skill in the art to use the copolymer of Wendel et al as the non-cellulose reactive sizing agent disclosed by Frolich et al or, alternatively, to form mixtures of the dispersions of Frolich et al and Wendel et al to also be used for

sizing paper as a functionally equivalent composition and to optimize the mixed composition.

Claims 11-12: Frolich et al discloses a preferred embodiment wherein the dispersion is anionic (col 6, lines 54-59). Examples are given showing better performance when the dispersion is anionic (col 9, line 26 to col 10, line 27, especially col 10, lines 25-27). Example 1 also discloses a pH for the dispersion of 5 (col 9, lines 34-35). Wendel et al discloses that the emulsions are stable at a pH from 2 to 12 (col 5, line 68 to col 6, line 3).

Claims 13-16: Frolich et al and Wendel et al are applied as above. With regard to Claim 14, Frolich discloses that the dispersant is made hydrophobic by attaching one or more hydrophobic chains having from 4 to 30 carbon atoms (col 3, lines 29-36). Wendel et al discloses alkyl sulfates, alkyl sulfonates and alkyl phosphates that can be in the form of adducts of ethylene oxide without specifying the number of oxyethylene (ethylene oxide) units. However, other ethoxylated surfactants disclosed by Wendel et al comprise chains of 7 to 50 oxyethylene units with a long chain alcohol to form a hydrophobic portion (col 5, lines 8-10). Holmberg et al discloses similar surfactants having 2-50 moles of alkylene oxide units for use in compositions comprising a non-cellulose reactive sizing agent and/or a cellulose reactive sizing agent, such as a ketene dimer or multimer. It would have been obvious to one of ordinary skill in the art to include the claimed number of oxyethylene units in the alkyl sulfate, alkyl sulfonate and alkyl phosphate dispersants as a range typically used for such dispersants.

Claims 17-18: Frolich discloses bringing together the components of the dispersion and homogenizing the mixture to obtain an aqueous dispersion (col 7, lines 62-66). Wendel et al discloses that the emulsifiers form a homogeneous mixture in water (col 5, lines 7-9).

Claims 19-20: The processes of forming a paper web and dewatering on a wire to obtain a paper and white water are standard papermaking procedures and would have been obvious to one of ordinary skill in the art. Addition of the sizing dispersion to the stock or to a paper surface is disclosed by Frolich et al (col 9, lines 4-10).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art
Unit 1791

/Dennis Cordray/
Examiner, Art Unit 1791